

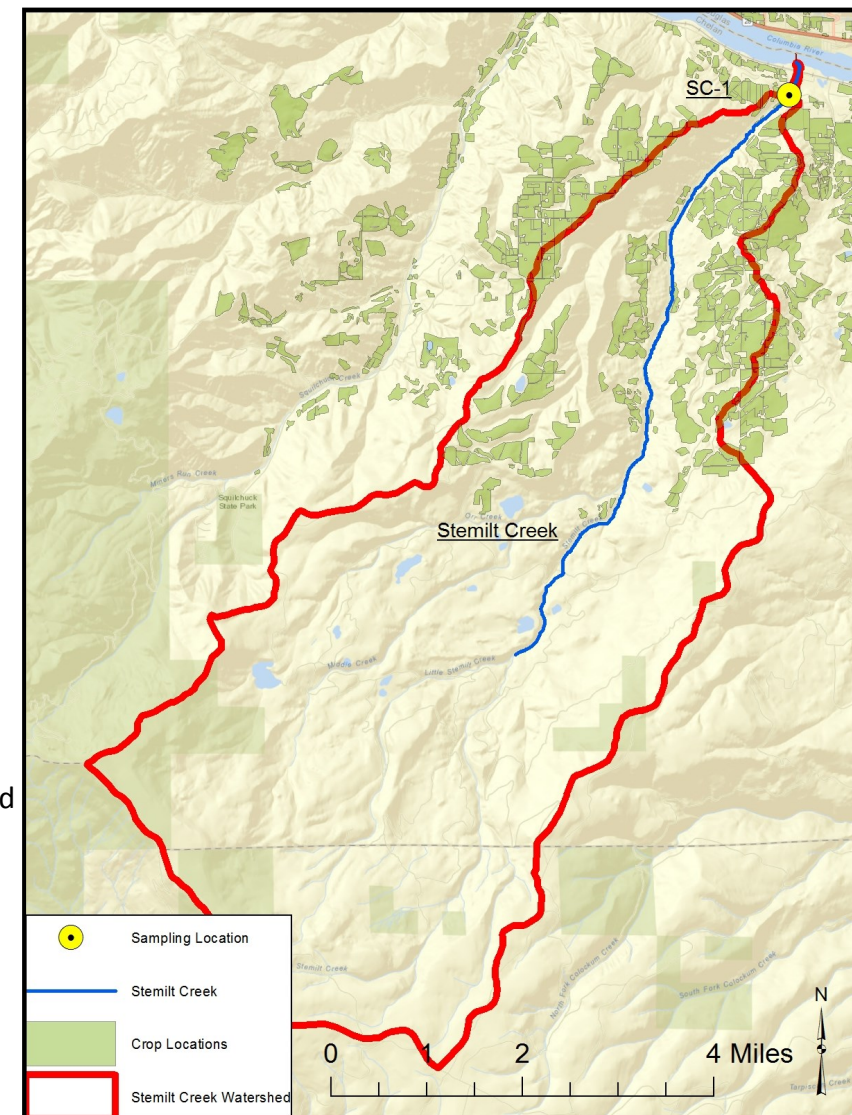
Summary of 2015 Surface Water Monitoring Program Results  
Washington State Department of Agriculture  
Natural Resources Assessment Section  
September 2016

The Washington State Department of Agriculture has monitored pesticide concentrations in surface water throughout the state since 2003. Water samples are collected during the typical pesticide use season (March through September). Fourteen sites were monitored in Washington in 2015, four of which are in Chelan County. State and federal agencies use this data to evaluate water quality and make exposure assessments for pesticides registered for use in Washington State.

Water has been tested from Stemilt Creek from 2013 through 2015. The watershed drains about 21,192 total acres with 11.02% (2,336 acres) of the acres devoted to agriculture. The main crops are cherry, apple, and pear. The very lower reach of Stemilt Creek provides habitat for spring chinook, and summer steelhead.\*

## Sampling Details

- Samples were collected for 25 weeks, from March 10 through August 25.
- Water samples were tested for 206 chemicals: current and legacy insecticides, herbicides, fungicides, rodenticides, wood preservatives, and pesticide degradates.
- Sample analysis for pesticides and total suspended solids was conducted at Manchester Environmental Laboratory in Port Orchard, WA.
- General water quality parameters; dissolved oxygen, conductivity, pH, water temperature, and streamflow were measured at every sampling event.
- Air and water temperature (measured every 30 minutes) was monitored for the entire sampling season.
- For a short period of time, 5 weeks, additional water samples were collected and analyzed for glyphosate and its degradate, AMPA.
- Drought conditions resulted in less than normal streamflow throughout the season.
- Juvenile fish, of an unknown species, were observed several times at the site during sample collection.



This table shows the pesticides detected, with dates and concentrations. They are color coded to identify which assessment criteria were surpassed. The assessment criteria used here are state and federal water quality criteria, reduced by half for safety. This 0.5 safety factor is used to make sure the criteria protect aquatic life and water quality issues are found early. Watersheds with detections above the criteria are prioritized for more monitoring and educational outreach. See <http://agr.wa.gov/PestFert/natresources/SWM> for more information.

Assessment Criteria		Month and Day		Mar				Apr				May				Jun					Jul				Aug	
		Analyte Name †	Use‡	10	17	25	31	7	14	21	28	5	12	19	27	2	9	16	23	30	7	14	21	28	4	11
May affect fish survival at sensitive life stages		2,4-D	H												0.037											
		4,4'-DDE	D-OC																							
Additional level of protection for endangered species		AMPA	H	--	--	--	--	--			0.009	0.009	0.013	--	--	--	--	--	--	--	--	--	--	--	--	--
		Bifenazate	I																		0.028					
May affect invertebrate survival		Boscalid	F								0.067											0.037	0.023			0.023
		Carbaryl	I-C									0.011	0.082													
Nearing a pesticide state water quality standard		Chlorpyrifos	I-OP		0.047		0.035	0.028																		
		Ethoprop	I-OP	0.042																						
May affect fish growth or reproduction with prolonged exposure		Fludioxonil	F														0.1									
		Glyphosate	H	--	--	--	--	--					0.032	--	--	--	--	--	--	--	--	--	--	--	--	--
May affect invertebrate growth or reproduction with prolonged exposure		Methoxyfenozide	I									0.005	0.015													
		Myclobutanil	F										0.014													
May affect aquatic plant growth		Pentachlorophenol	WP		0.026	0.018								0.031												
		Picloram	H									0.094					0.13	0.068	0.067	0.06	0.055		0.054			
May affect aquatic plant growth or reproduction with prolonged exposure		Piperonyl butoxide	Sy	0.045																						
		Propiconazole	F															0.037								
Below all identified criteria		Pyraclostrobin	F	0.014							0.029															
		Triclopyr acid	H																			0.028				
No published criteria available		Temperature	N/A	46.6	46.6	48.1	48.5	47.2	*	*	*	*	*	*	*	*	*	70.9	67.1	73.3	73.5	69.1	70.3	68.3	69.4	69.4
		Dissolved oxygen	N/A	11.98	11.75	11.8	11.07	11.49	11.8	10.08	10.38	10.64	9.91	10.29	9.78	9.79	8.64	8.64	8.97	8.57	8.65	9.39	8.88	9.56	8.89	9.09
Not detected (below detection limit)		Percipitation	N/A	0	0.53	0.32	0.07	0.22	0	0	0	0	0.3	1.6	0.04	0.09	0	0	0	0.06	0.01	0	0	0	0	0
		Streamflow	N/A	7.1	13.9	10.7	8.9	5.1	1.3	2.1	0.5	0.1	0.3	12.9	8.6	4.0	0.0	0.0	0.1	0.2	0.2	1.6	0.1	0.7	0.5	0.4
No Data	--	Total suspended solids	N/A	4	19	6	4	4	7	5	3	2	9	22	23	21	2	2	3	3	2	28	2	3	3	2
		‡ D: Degradate, F: Fungicide, H: Herbicide, I: Insecticide, N/A: Not applicable, OC: Organochlorine, OP: Organophosphate, Sy: Synergist, WP: Wood preservative, *Equipment malfunction. †Units are as follows: pesticides, µg/L; temperature, °F; dissolved oxygen mg/L; percipitation, week total inches and total suspended solids, mg/L. <b>Bold:</b> Indicates a temperature or dissolved oxygen value above state water quality standards.																								

### Results Summary

- Four of the 36 pesticide detections were above one or more assessment criteria, 3 for chlorpyrifos and 1 for 4,4’DDE.
- Chlorpyrifos detections in late March/early April were above an assessment criterion at concenerations that may affect invertebrate survival.
- Common products containing chlorpyrifos are Lorsban and Dursban.
- Chlorpyrifos is a pesticide of concern in Washington State, and has been detected in past years at concentrations above aquatic health criteria.
- A sample collected at the end of August showed levels of 4,4’DDE, a degradation product of DDT, nearing a state water quality standard.
- DDT products are no longer registered for use, but detections such as these are attributed to their persistence in the environment and ability to bind to soil particles.

### Recommendations

- Read and follow pesticide label directions to protect water quality.
- Eliminate drift and runoff to adjacent surface water
- Exhibit care when applying pesticides especially in spring (e.g. chorpyrifos) before vegetation along streams is leafed out.
- Maintain, inspect, and calibrate application equipment.
- Implement best management practices, including conservation buffers, vegetative filter strips, sediment basins, and setbacks from water. Detections of DDT and its degradates are closely associated with total suspended solids originating from soil erosion.
- Manage irrigation to prevent runoff, and check the weather forecast before application